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Electromagnetic Acoustic Transducer & Methods of Determining Physical Properties of Cylindrical Bodies using an Electromagnetic Acoustic Transducer

Abstract

An electromagnetic acoustic transducer for inducing and sensing vibrations in a cylindrical object and methods of using an electromagnetic acoustic transducer to determine resonant frequencies and physical properties of cylindrical objects. The electromagnetic acoustic transducers produce specific modes of vibration in cylindrical objects including axial shear vibrations, torsional vibrations, radial vibrations and plane strain vibrations. The methods of determining physical properties of a cylindrical objects include comparing sensed resonant frequencies of the cylindrical object to known relationships between resonant frequency and the physical properties of interest. The methods can be used to determine the temperature, dimensions, elastic constants, and damping coefficients of cylindrical objects, the magnitude of a load applied to a cylindrical object, or the texture or grain orientation of the material forming a cylindrical object.

Inventors

- Alers, George A.
- Auld, Bert A.
- Johnson, Ward L.

Citations

1. Expired U.S. Divisional Patent # 6,170,336
2. Expired Second U.S. Divisional Patent # 6,119,522

References

- Expired U.S. Patent # 5,895,856 issued 04-20-1999,
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Status of Availability

This technology is available in the public domain.

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